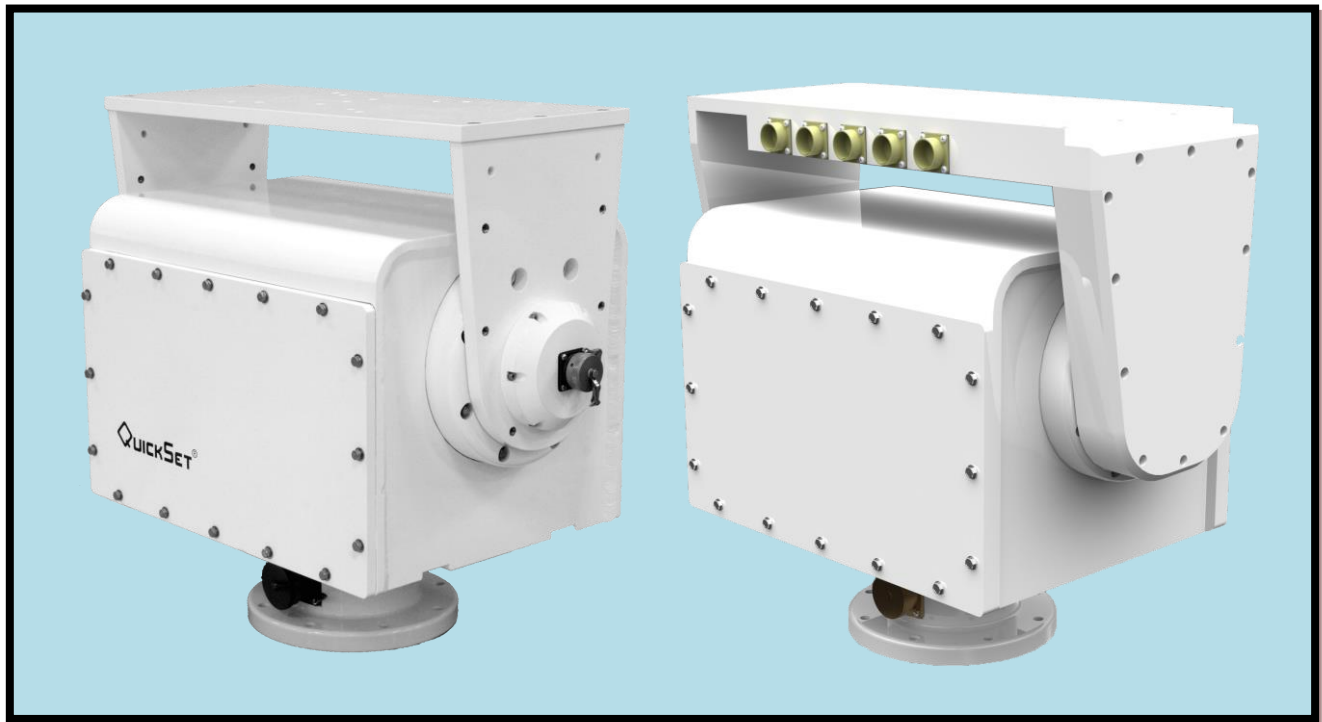


Product Manual

PRODUCT FAMILY: SENTRY SERIES QPT-200 & QPT-500
PRODUCT NAME: ICMS & ICMS CR



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SECTION I - GENERAL INFORMATION

1A Scope

This manual provides information for installation, adjustment, maintenance and repair of the Quickset Pan & Tilt Series QPT-200/500 ICMS (Integrated Control Marine Sentry) & ICMS CR (Continuous Rotation).

CAUTION: READ THIS MANUAL COMPLETELY BEFORE CONNECTING POWER TO THE UNIT. INJURY TO PERSONS OR DAMAGE TO THE UNIT AND ASSOCIATED EQUIPMENT CAN OCCUR IF THE UNIT IS NOT USED PROPERLY.

1B Purpose of Equipment

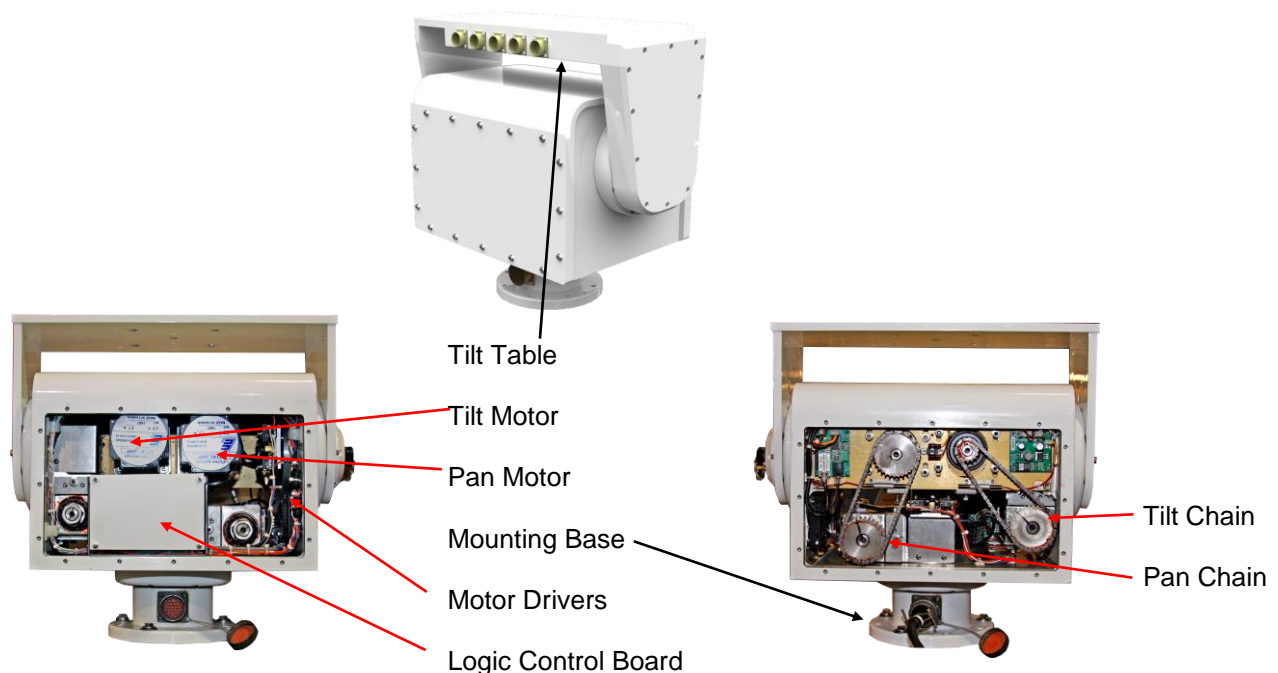
This ruggedly constructed, heavy-duty, all weather environmental Pan & Tilt is designed to remotely position a load of 500 lb.-ft. (QPT-500) or 200 lb.-ft. (QPT-200) to any degree of azimuth from 0 degrees to $420^{\circ} \pm 210^{\circ}$ or elevation from $+90^{\circ}$ degrees above to -90° degrees below the horizon. When the unit is in the normal level and upright position, the mounted equipment may be positioned to any degree of azimuth within a preset 420° circle. The equipment tilt table can be moved to any angle from horizontal to approximately $\pm 90^{\circ}$ in direction. (Continuous Rotation models do not have hard Pan Limits; on these models, hard pan limits are excluded.)

1C Description of Equipment

This device is constructed of aluminum and stainless steel and weighs approximately 175 pounds (79.4 kg). The exterior parts have a powder coated paint finish. Dimensions are shown in the attached drawings section.

Access to the unit's interior is provided by a two covers, which can be removed in the field.

The interior houses the pan and tilt motors, gear assemblies, pan and tilt shafts, limits stops, a microprocessor control board, and 2 motor driver modules.



1D General Specifications

1D-1 Operational Conditions

Ambient Temperature:

-22° F to +131° F (-30° C to +55° C) with heaters, -15°C to 55°C (5°F to 131°F) without heaters

Weather Environment:

This unit is completely gasketed and sealed to withstand water, dust, and humidity penetration (Meets IP66 / IP67 Standards). Extreme temperature lubricants are used throughout; however, for operation below +5 degree F, the use of the heater is recommended. The standard included heater system consists of two 24 volt 65 watt heaters with self-regulating thermostat. **Refer to your supplied schematic for your exact configuration.**

1D-2 Mechanical

Gearing:

Specifically designed heavy-duty hardened steel precision worm gear assemblies for quiet, high torque capability, passive braking & holding, and anti-backdrive.

Backlash Take-up:

Adjustable in both the Pan & Tilt sections. (See section 4C & 4D)

Bearings:

Pan section – Sealed ball & tapered bearings.
Tilt section – Sealed ball & tapered bearings.

Tilt Table:

Rigidly fastened to tilt worm gear.

Limit Switches:

Internally adjustable for both pan and tilt on non-continuous models. Continuous rotation models have tilt limits only.

1D-3 Electrical

Power Input Required:

Positioner operates from a 48 VDC (QPT-500) or 24 VDC (QPT-200) source. (Minimum of 350 watts)

Motors:

1.8° Stepper motors with separate 10:1 micro-stepping drivers

1E Standard Model Matrix / Features

MODEL NUMBER	QPT-200	QPT-500	DC INPUT VOLTAGE	"A"	"B"	"0"	"CR"
7-4200A	√		24	√			
7-4200B	√		24		√		
7-42000	√		24			√	
7-4300A	√		24	√			√
7-4300B	√		24		√		√
7-43000	√		24			√	√
7-4500A		√	48	√			
7-4500B		√	48		√		
7-45000		√	48			√	
7-4600A		√	48	√			√
7-4600B		√	48		√		√
7-46000		√	48			√	√

The last digit of the model number ends in 0, A, or B.

0 = Universal Model

A = Camera Control Model

B = Camera pass-through Model

CR = Continuous Pan Rotation Model

The QPT-200 operates from a 24VDC source. The QPT-500 operates from a 48 VDC source and internally creates a 24VDC voltage to operate the control board. (Both require 350 watts)

Correct input voltages must be supplied to the unit. CHECK THE SCHEMATIC SUPPLIED WITH YOUR UNIT FOR PROPER CONNECTIONS.

UNIVERSAL MODELS (4 Ports)

Communication to Sensors

• 4-Port Payload Interface:

- Port A (Std.): Mil-Spec 26-Soc, 16 Shell MS3112E16-26S

RS232/422, Analog Zoom and Focus Lens Control and Feedback

- Port B (Std.): Mil-Spec 26-Soc, 16 Shell MS3112E16-26SW

Payload pass through connectivity from base connector supplying

Ethernet (CAT-5), video coax (75 ohm), internally generated 12VDC,

external user supplied DC auxiliary power and optional payload to pan/tilt control interface (CAT-5).

- Port C (Std.): Mil-Spec 26-Soc, 16 Shell MS3112E16-26SW

Payload pass through connectivity from base connector supplying

Ethernet (CAT-5), video coax (75ohm), internally generated 12VDC and

external user supplied DC auxiliary power.

- Port D (Std.): Mil-Spec 26-Soc, 16 Shell MS3112E16-26S

RS232/422, Analog Zoom and Focus Lens Control and Feedback

• Power to Sensors:

- 12VDC @1.5A, 24Vdc @ 2.5A on/off switchable under software control

(2.5A @ 24VDC includes camera heater and AUX outputs)

- Two user supplied external supplies @ 7.5A max each (8 A total over multiple egress outputs).

Camera Control Model (PORT A on Tilt Axis)

Communication to Sensors

- RS232/RS422 configurable UART provides communication path through QuickSet 62H "Tunneling" command. See protocol manual.
- Two 12VDC , bidirectional PWM motor drivers designed for Zoom & Focus motors of analog lenses with 7 bit speed control.
- Two analog inputs designed to be used with Zoom & Focus lens position potentiometers to allow preset positions to store Zoom & Focus attributes.
- Two auxiliary 24 VDC @ 2.5A on/off switchable power sources designed as relay drivers.
- One 12VDC @1.5Aon/off switchable power source designed for camera power
- One user external supply @ 7.5A maximum

Camera pass-through Model (Port B on Tilt Axis)

Communication to Sensors

Tilt Axis Payload Interface Port B (Std.): Mil-Spec 26-Soc, 16 Shell
MS3112E16-26SW

- Payload pass through connectivity from base connector supplying Ethernet (CAT-6), video coax (75 ohm), internally generated 12VDC, external user supplied auxiliary power
- Serial cable from payload for either control of payload thru Camera 2 of PTCR-96 board (default) or payload to pan/tilt serial control (IP or RS232/422), in lieu of other control interfaces.
- Power to Sensors - 12Vdc @1.5A, on/off switchable under software control
- Two user supplied external supplies @ 8A max each. (52VDC max)

(PORT C)

- Port C = Same as Port B

(PORT D)

- Port D = Same as Port A



SECTION II - INSTALLATION

2A General

To achieve optimum results from this unit, proper installation procedures should be followed, primarily: location & setting limit stops. These items are reviewed in the following paragraphs (2C-1, 2C-2, 2C-3)

2B Unpack and Inspect

Carefully unpack the unit and examine for signs of physical damage, particularly dented or broken parts, and damage to wire harness or distortion of tilt table or body cover. If any are observed, notify the freight carrier immediately for claim handling. Retain all packing material until claim is settled.

Check the box contents for Pan & Tilt, CD(s) with manuals, test cable, mating connector(s), and schematics. Retain packing materials for shipping or storage convenience.

2C Installation Procedures - Mechanical

2C-1 Location Site

Select a mounting location that will provide the desired maximum viewing angles permitting the Pan & Tilt or load NOT to come in contact with or strike any objects in the sweep paths. Adjustable limit switches are provided to limit the degree of travel in both pan and tilt. The pan section travel can be narrowed from maximum of 420° to any lesser sweep, the tilt section from 90° above and below horizon to anything less. Continuous rotation models have no Pan limit switches.

2C-2 Mounting

The mounting base is 8" in diameter, with eight .41" (.375" on RF models) diameter holes on a 7.0" diameter bolt circle. Consideration of wind loading and ice buildup factors on your object and Pan & Tilt is important when calculating how rigid a mounting platform is required. We recommend 3/8-16 stainless steel mounting hardware of a suitable strength grade.

On the side of the base above the mounting flange is a military grade 43-pin connector. The connector is oriented to the rear of the base when the Pan & Tilt is in the center of its 420° travel path.

2C-3 Setting Limit (Switches) Stops

Pan limit stops are located internally above the switch plate. Tilt limit stops are located internally on the tilt shaft directly between the tilt limit switches.

CAUTION: UNITS ARE SHIPPED WITH FACTORY LIMIT STOPS SET AT MAXIMUM VALUE. BE CAREFUL TO PROVIDE ADEQUATE CLEARANCE AROUND PERIMETER OF THE UNIT IF IT IS TO BE OPERATED.

CAUTION: THE UNIT SHOULD NOT BE OPERATED WITH LIMBS IN ANY POSITION THAT COULD BE ENGAGED BY ANY MOVING PARTS (GEARS, TILT TABLE). TORQUE IS OF SUFFICIENT STRENGTH TO CRUSH OR SEVERELY INJURE A PERSON.

2C-4 Internal Access

Internal access is gained by removing the two covers. It is easiest to remove with the tilt table in the horizontal (mid) position. Remove the 16 screws in each cover. If the table is in any other position it may be necessary to reposition the table to the horizontal position.

The hardware used to mount equipment to the table must not protrude below the table excessively to prevent hitting the top/covers when the unit is tilted.



2D Installation Procedures - Electrical

2D-1 Wire Selection:

Very careful consideration should be given to the type of cable utilized in order to achieve long-term reliability and avoid costly mistakes. Many factors are involved in choosing the cable:

- (a) The type of run; i.e. underground, overhead – A cable designed for the application should be utilized.
- (b) The size of the conductors – The size of the conductors (AWG) depends on the length of the cable run and the amount of current carried.

Refer below for the suggested AWG.

Wire Selection

AWG # - (Stranded Copper)

Chart based on 10 amp draw in main power leads.

<u>Wire Size</u>	<u>Distance in feet</u>
# 18	16
# 16	26
# 14	42
# 12	67
# 10	107
# 8	170

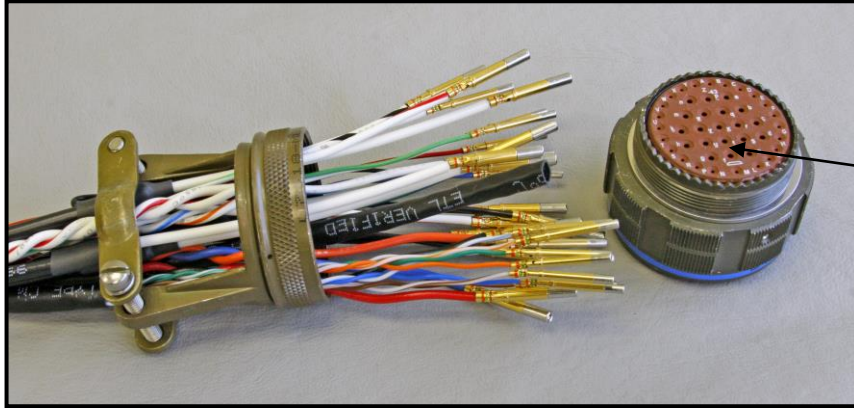
The ground line is connected to the Pan & Tilt chassis. It should be returned to a local earth ground at the Pan & Tilt site. Adhere to the local electrical codes.

IT IS RECOMMENDED that ALL RS232, RS422, and IP wiring be brought to a convenient location for testing with a laptop. This could be the base of a tower or pole in some cases. This allows operation of the unit from the ground with a laptop.

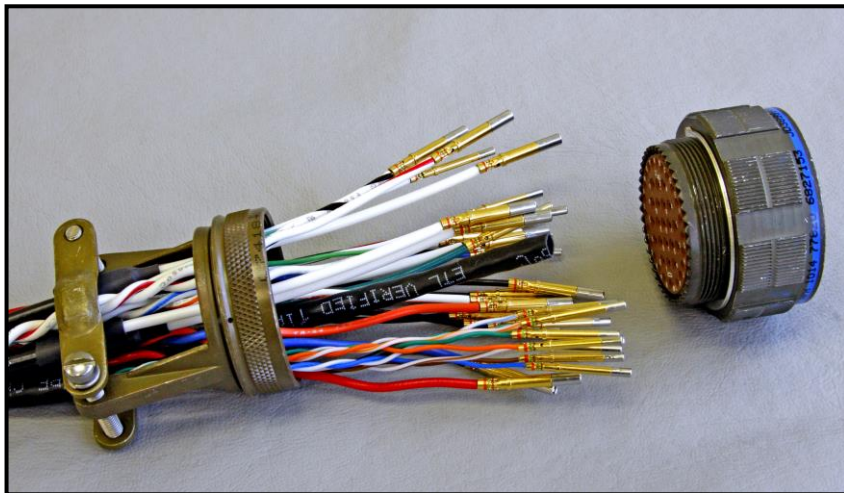
IT IS RECOMMENDED that the installation use the supplied connector for the product installation, and the supplied test cable be retained for diagnostic & servicing purposes.

2D -2 TYPICAL Connector Installation:
REFER TO YOUR SUPPLIED SCHEMATIC FOR CORRECT CONNECTIONS
Pan & Tilt Site.

Carefully crimp the cable leads to the pins supplied.



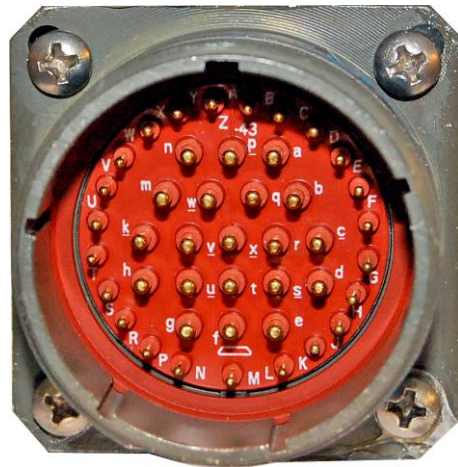
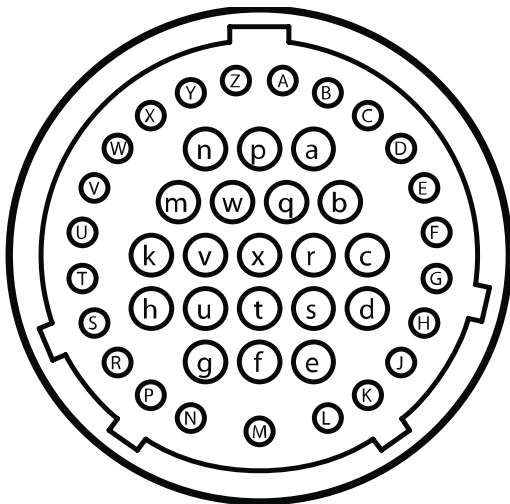
Install connector as shown, feeding wires through back shell/clamp before inserting into plug. The wires are inserted through the rubber side of the connector. The rubber forms a watertight seal.



Cable Connector

Make certain the connector is assembled utilizing all of its parts, to insure its weatherproof integrity.

NOTE: Models vary, check your supplied schematic for proper connections.



Q550088 D38999/20JW43PN 43 Pin 25 Shel

SECTION III - THEORY OF OPERATION

3A General

Overview

The positioning system consists of two stepper motors with their respective drivers controlled by a single control circuit board. All electrical connections to the unit are accomplished through a base mounted connector. The unit is powered by 48 VDC, which is then distributed to each of the motor drivers and regulated down to 24VDC to supply the control circuit board and IP interface board.

The IP interface board converts IP protocol to RS422, and the RS422 control communication is processed on the control circuit board, providing control and status information on the buss. The positioner can also be operated via RS232 or RS422 by setting the switches for serial control. **(SEE IP / SERIAL CONNECTION & SETTINGS PAGE AT END OF MANUAL)**

Also connected to the circuit board are two incremental encoders (one for the pan axis of motion, and one for the tilt), and four "hard" limit switches which provide indication for pan-left, pan-right, tilt-up, and tilt-down limit of travel. *Continuous Rotation models have only Tilt limit switches.* The 9000 line encoders with quadrature decoding provide 36000 pulses per 360 degrees of rotation. This results in 0.01 degrees per pulse with no rounding errors. The positions are indicated in 0.01-degree readouts.

Input Connector

The power input connector is a sealed 43-pin connector mounted on the base of the Pan & Tilt.

Control Board

The control board is located inside the rear of the cabinet on the lower right hand side. The control board processes all communication and position information and presents it through the serial buss via the protocol.

Limit Switches

In non-continuous models there are limit switches in the Pan & Tilt for each axis of motion. In continuous models, there are only Tilt limit switches. Their function is to limit travel in both directions by first closing contacts for the control board logic for hard limit indication. There are secondary kill switches, which activate if the unit ever is commanded to move past the hard limits. The secondary switches interrupt the motor driver power to absolutely stop movement. These secondary limit switches act as an additional safety in limiting travel if the primary limit did not operate. These are set to activate at a few degrees of travel beyond the first hard limit switches. The only way to disengage these limits is to manually back the unit up using a large screwdriver to manually turn the carrier to deactivate the switch when the other limit issue is resolved.

Motor Drivers

Two stepper motor driver modules are used to operate the stepper motors. The motors are energized in the standby mode to provide braking.

Drive System

The stepper motors are used for pan & tilt functions. The drive system on the tilt drive provides an overall ratio of 500:1 and the drive system on the pan drive provides an overall ratio of 250:1.

All single pitch worm gears inherently resist being driven backward and this effect is added to the effect of the braking cited above, thus assuring camera steadiness, even in gusting winds.

SECTION IV - ADJUSTMENTS

4A Backlash

Backlash is defined as unwanted movement in the pan or tilt section. This “play” develops as a result of normal wear and is easily corrected. Backlash can develop in two areas: A, excessive center distance between worm and worm gear, or B, axial movement of the worm.

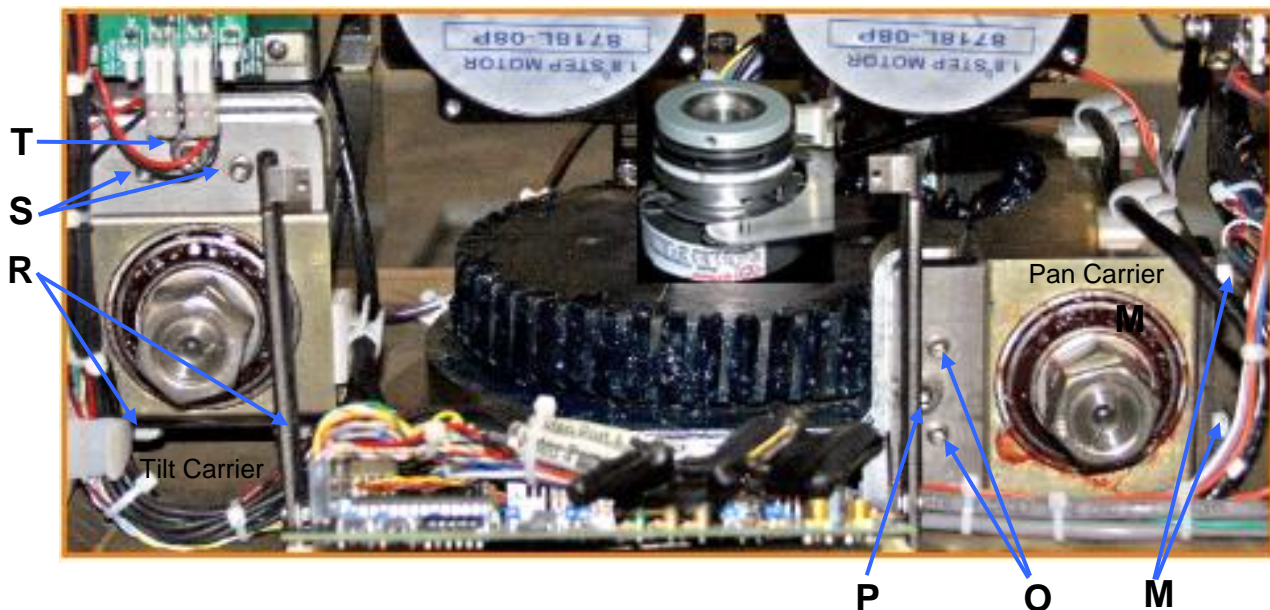
4B Interior Access

Stop the unit with the tilt head in the horizontal position. Remove power. Unbolt the covers by removing the 16 bolts on each cover. Set the covers aside.

4C Pan Section Backlash Adjust

4C-1 Test for backlash by gripping tilt table and manually try to rotate table left and right. Free play should be between 0 and 1/64”. If movement is excessive, inspect to determine if: A, worm and worm shaft move axially and/or; B, lost motion exists between worm and worm gear. If condition A exists, first check to see that lock nuts adjacent to roller bearings are tight enough to remove any play (do not tighten more than required to remove play); second, check to see that entire worm carrier is securely bolted in place.

4C-2 To adjust clearance between worm and worm gear, use the controller to rotate unit to the tightest point. Shut off power. FOR REMOVING BACKLASH: With a wrench, slightly loosen the four hex bolts (M) that secure the pan worm carrier. These are located on the side of the carrier (2 front, 2 rear). Loosen the screws (P) on each side and tighten the 4 setscrews on the side (O) (2 front, 2 rear) until wedge is broken free. Tighten the bolts (M) on each end equally to achieve minimum backlash. Do not over-tighten these bolts! Back-off set screws (O) and re-tighten screws (P). Again test for backlash.



FOR ADDING BACKLASH: A small amount of backlash can be added by loosening the 4 setscrews on the side (O) (2 front, 2 rear) and tightening the screws (P). To add more backlash, loosen the 4 setscrews on the side (O) (2 front, 2 rear), slightly loosen bolts (M), and tighten the screws (P). Do not over-tighten these bolts! Again test for backlash.

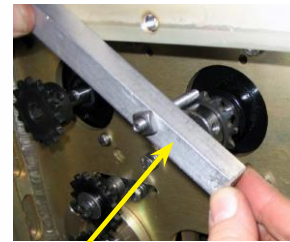
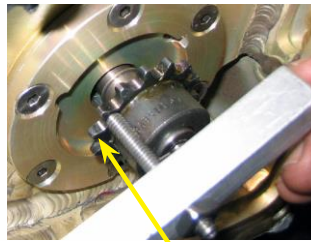
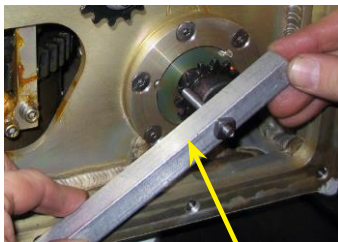
4D Tilt Section Backlash Adjust

4D-1 Test for backlash by gripping tilt table and manually try to tilt table forward and back. Free play should be between 0 and 1/64". Test for excessive movement as described in section 4C-1.

4D-2 To adjust clearance between worm and worm gear, use the controller to rotate unit to the tightest point. Shut off power. **FOR REMOVING BACKLASH:** With a wrench, slightly loosen the four hex bolts (R) that secure the pan worm carrier. These are located on the side of the carrier (2 front, 2 rear). Loosen the screws (T) on each side and tighten the 4 setscrews on the side (S) (2 front, 2 rear) until wedge is broken free. Adjust the bolts (R) on each end equally to achieve minimum backlash. Do not over-tighten these bolts! Back-off set screws (S) and re-tighten screws (T). Again test for backlash.

FOR ADDING BACKLASH: A small amount of backlash can be added by loosening the 4 setscrews on the side (S) (2 front, 2 rear) and tightening the screws (T). To add more backlash, loosen the 4 setscrews on the side (S) (2 front, 2 rear), slightly loosen bolts (R), and tighten the screws (T). Do not over-tighten these bolts! Again test for backlash.

4E Sprocket Alignment



Using special tool (as shown above and noted below) held across the face of the enclosure, check sprocket alignment of the pan and tilt pair of sprockets. Using special tool, adjust its screw to touch the front surface of the teeth on one sprocket. Then reposition tool with screw at second sprocket to check spacing without readjusting screw on tool. Loosen the motor sprocket setscrew, slide that sprocket to the proper (in/out) position until it touches the screw on tool, and tighten the sprocket setscrew. The two sprockets must be precisely in line to ensure uniform load distribution across the chain width for maximum life.

NOTE: The tool may be fabricated from a stiff flat piece of aluminum or steel with a long 1/4-20 bolt or set screw as shown. Drill/tap several 1/4-20 holes in the metal piece to allow various hole locations as needed for your particular unit. Lock the screw height with a 1/4-20 nut as shown.

4F Setting The Limit Rings

Setting The PAN Limits --- Reference Figure 1 below.



PAN LIMIT RINGS

The Pan Limit rings which are used for setting the “hard” (mechanical) pan rotational limits are mounted in the center of the Pan and Tilt on top of the pan position encoder, which is mounted on top of the Pan worm gear. There are two adjustable limit rings, one white and one black, for adjusting the Clockwise (CW) and Counter-Clockwise (CCW) directions of travel respectively. Each of these rings have a pin mounted on them that extends outward and engages a lever arm, which in turn activates a mechanical limit switch. These switches signal the microcontroller of the P&T, and will throw a fault when either switch is activated, stopping motion of the P&T, and signaling the operator. Moving the lever arm in one direction activates the CW limit and moving in the other direction activates the CCW limit.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	QS03749	SHAFT 435 TRIP LIMIT QPT500 W/ ENCODER	1
2	QS60047	PHASE RING	1
3	1-12596-2	PIN SPRING 3/32X3/8 Steel	5
4	QS60048-W	PAN LIMIT RING - NYLON White	1
5	HW00122	Snap Ring VS-137	4
6	QS60049	RETAINING RING - PAN TRIP	1
7	1-12482-3	Screw Set #6-32 x 1/4 Cup Pt. SS	1
8	HW00701	PIN COILED SS 3/32 X 1/2 LG	1
9	1-12014-6	SCREW SET #8-32X3/16 CUP POINT	3
10	QS60048-B	PAN LIMIT RING - NYLON Black	1

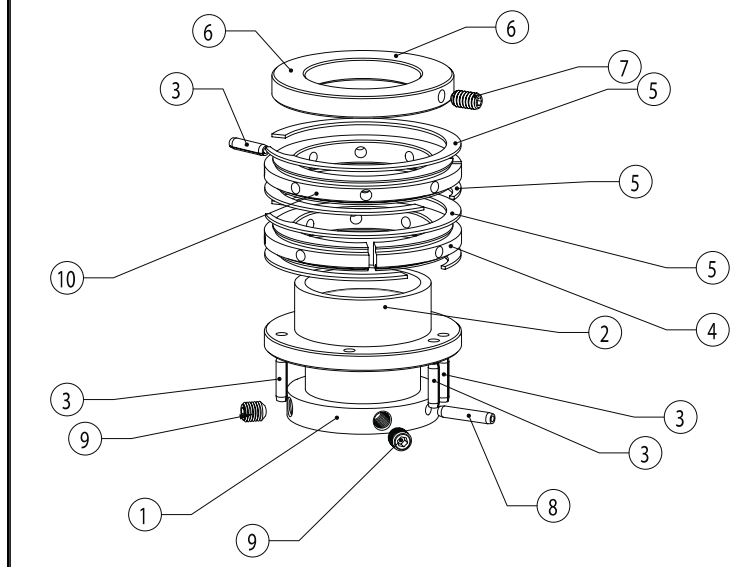
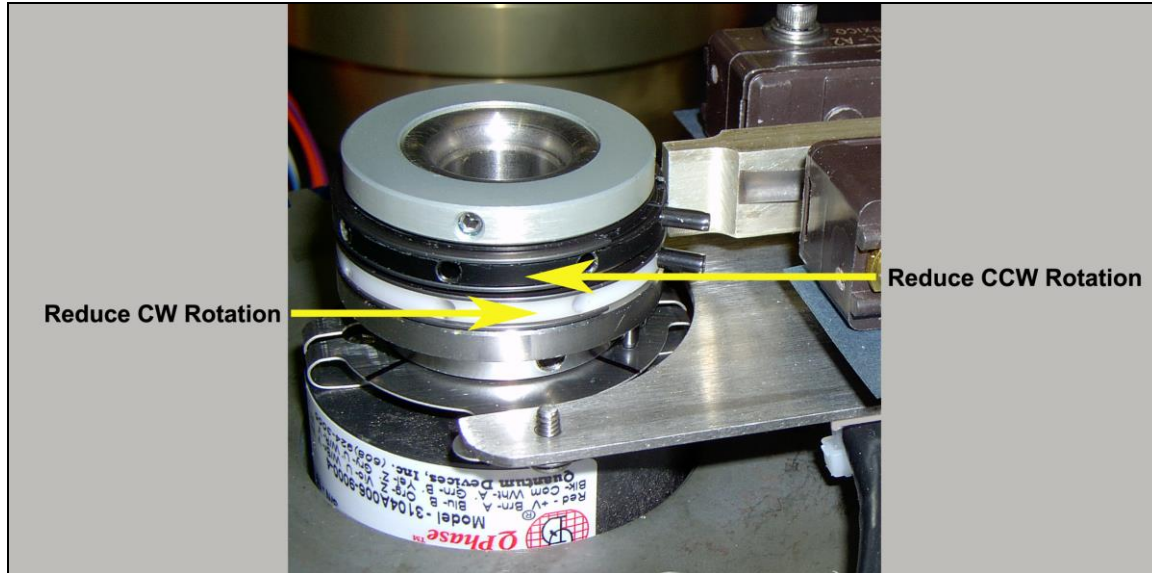


Figure 1

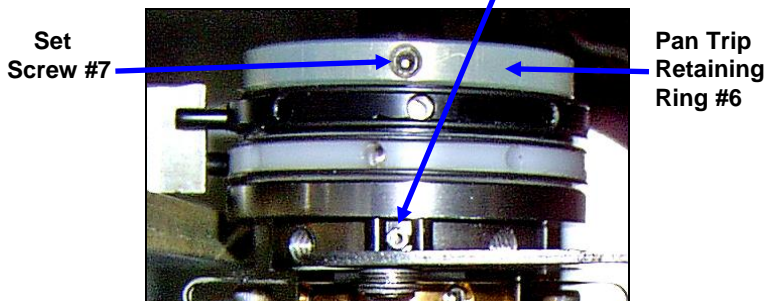
To allow total motion greater than 360° of rotation, the trip rings are friction mounted on a movable shaft called a "Phase Ring". There are 3 pins extending downward from the Phase Ring that engage a pin on the Trip Ring Shaft, limiting the Phase Ring rotation to approximately 118° of rotation. The trip ring rotation together with the Phase Ring gives the user the ability to set the total amount of rotation to approximately 478°, however during manufacture the rings are set to a total rotation of 420° ($\pm 210^\circ$).



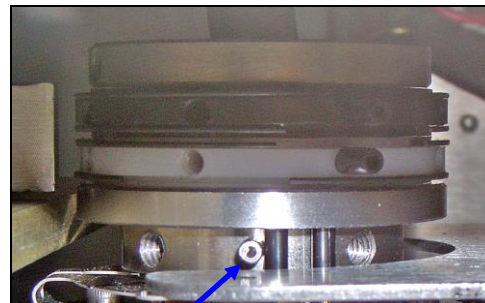
To reduce the amount of CW rotation, move the **White trip ring (#4 in Figure 1)** counterclockwise (as viewed from the top of the P&T). To reduce the amount of CCW rotation, move the **Black trip ring (#10 in Figure 1)** clockwise (as viewed from the top of the P&T). Make sure in either case that you rotate the ring far enough to assure that the phase ring has moved far enough to engage the appropriate pin to stop phase ring rotation. This will assure that you are moving the trip ring with respect to the phase ring and not just moving the phase ring alone.

It is strongly recommended that you test the setting by rotating the P&T and verifying the position at which you have set the limit ring.

As shipped, the Pan limit switches are set to limit rotation to a maximum of 420.00° ($\pm 210^\circ$). To reduce this amount of travel to a value of 135.00° or more, you may move the black and white limit rings in the direction indicated. To reduce the total amount of travel to <135°, you will need to remove the **Pan Trip Retaining Ring (#6 in Figure 1)** by loosening the **Set Screw (#7 in Figure 1)** and lifting upward, then lifting the Pan Trip Ring assembly and placing the **two adjacent downward facing pins (#3 in Figure 1)** on each side of the **outward facing pin (#8 in Figure 1)** that extends outward from the QPT500 **Trip Limit Shaft (#1 in Figure 1)**. Then reposition the Pan Trip Retaining Ring back onto the shaft and tighten **set screw (#7 in Figure 1)**. This will keep the phase ring from moving, and allow settings less than 135°.



Positioned for less than 135°
(must be between 2 pins)



Positioned for greater than 135°
(must be as shown)

PAN MAX RANGE with phase ring on short side

PAN Total Range

478° ($\pm 239^\circ$) with trip rings at Maximum setting

134° ($\pm 67^\circ$) with trip rings at Minimum setting

PAN RANGE with phase ring captivated between pins

PAN Total Range

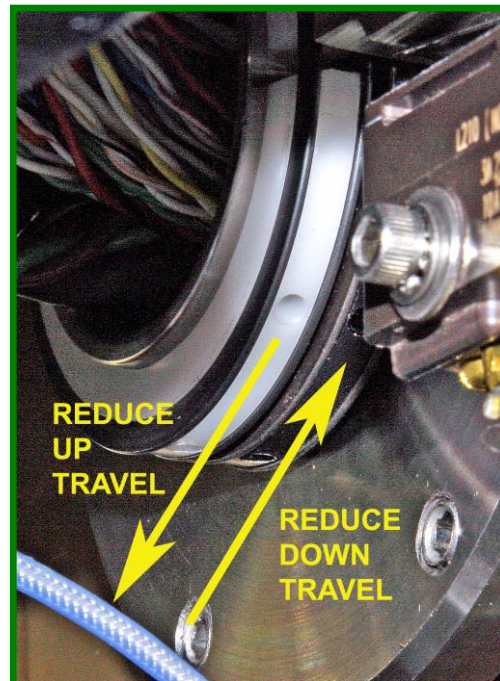
361° ($\pm 180.5^\circ$) with trip rings at Maximum setting

15.3° ($\pm 7.65^\circ$) with trip rings at Minimum setting.

Setting The TILT Limit Rings

The tilt limit stop consists of 2 ring collars, each with a protruding tripper pin. One collar is for up-limit (WHITE); the other is for down-limit (BLACK). They are located on the tilt shaft next to the tilt limit switch finger. There are **NO SETSCREWS** just friction fit to lock the position of each ring collar. Positioning is achieved by rotating the collars using a pointed tool to engage the holes in each ring collar. A small hex wrench (Allen key) may work. Always test the unit under power to ensure the limits are set at the desired angles.

VIEWED FROM REAR OF UNIT



FACTORY TRIP RING SETTINGS

Hard limits:

Limit Switch: Pan: 420° ($\pm 210^\circ$, $\pm 1^\circ$) Tilt: 180° ($\pm 90^\circ$, $\pm 1^\circ$)

CONTINUOUS ROTATION (CR) models have no Pan limit switches.

SECTION V - MAINTENANCE AND REPAIR

5A Routine Maintenance

Inspect the unit on a regular basis to assure the early detection and correction of any disorder before it becomes a problem. Required frequency may well be found to depend on location, with those units subjected to the most severe conditions and heaviest use requiring the most frequent attention.

5B Inspection Intervals

The recommended intervals are:

<u>Duty-Cycle Usage</u>	<u>Inspect at</u>
20%	6 Month Intervals

5C Inspection Items

Exterior

Finish – Examine for signs of damage to the exterior paint or cover fitting integrity (gasket).

Gaskets – Gaskets are in conformance with specification. Inspect and replace as necessary.

Wiring – Examine the exterior wiring harness for signs of crimping, cracked insulation, frayed or pinched wires and loose connectors.

Mounting – Check that the mounting bolts are securely tightened.

Other hardware – Check that none has come loose.

Interior

Wiring – Examine the wiring for signs of cracked insulation, frayed or pinched wires, and loose connectors.

Loose Hardware – Check and tighten.

Cleanliness – Any foreign material, such as dust, dirt, or chips, acts as an abrasive in the gear grease and reduces gear life. Make certain to remove all foreign material.

Lubrication – Visually check the gears for worn teeth, poor alignment and chips.

Gears/Worms – Lubricate the worms and worm gears every time the unit is opened (at least every 6 months). A special lubricant is available from QuickSet Customer Service (# 9-54675) or it can be purchased locally. The Pan & Tilt carriers have a grease-fitting on the side.



LUBRIPLATE SYNXTREME HD-1. This is an extreme pressure lubricant, and we do not recommend a substitute. This GREASE CAN NOT BE MIXED WITH ANY OTHER GREASE.



Bearings – The four ball bearings on the pan and tilt shafts are lubricated for life and sealed. The tapered roller bearings in each of the two worm shaft carriers are lubricated with QuickSet lubricant available from QuickSet Customer Service.

Motors – These are lubricated for their rated life and require no additional lubrication.

Chains – These should be lubricated with LUBRIPLATE SYNXTREME HD-1, Quickset # 9-54675.

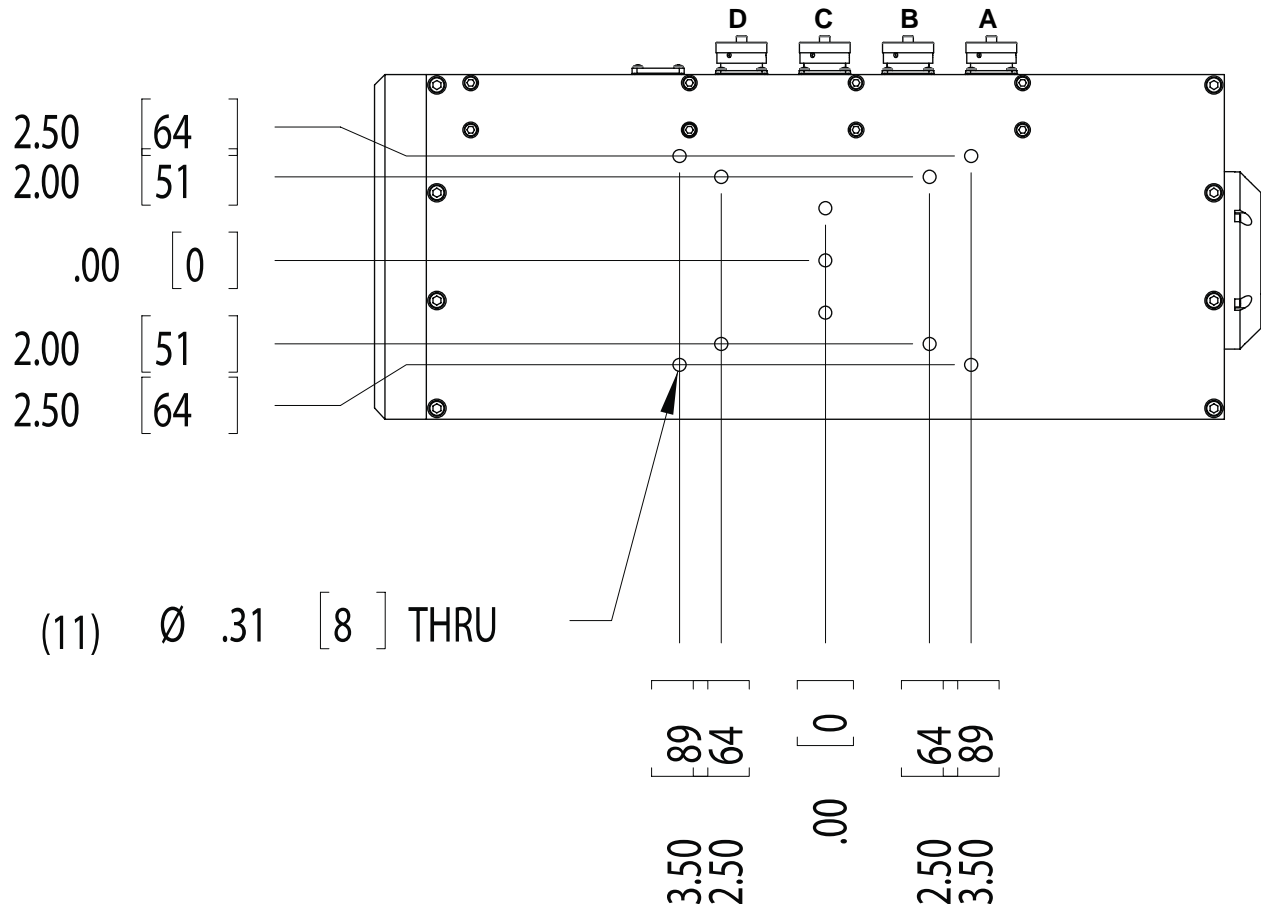
Chain Adjustment – Slack in chains is not detrimental and does not affect backlash. Do not over-tighten them.

Backlash – Check for unwanted movement (looseness) in either pan or tilt drives.

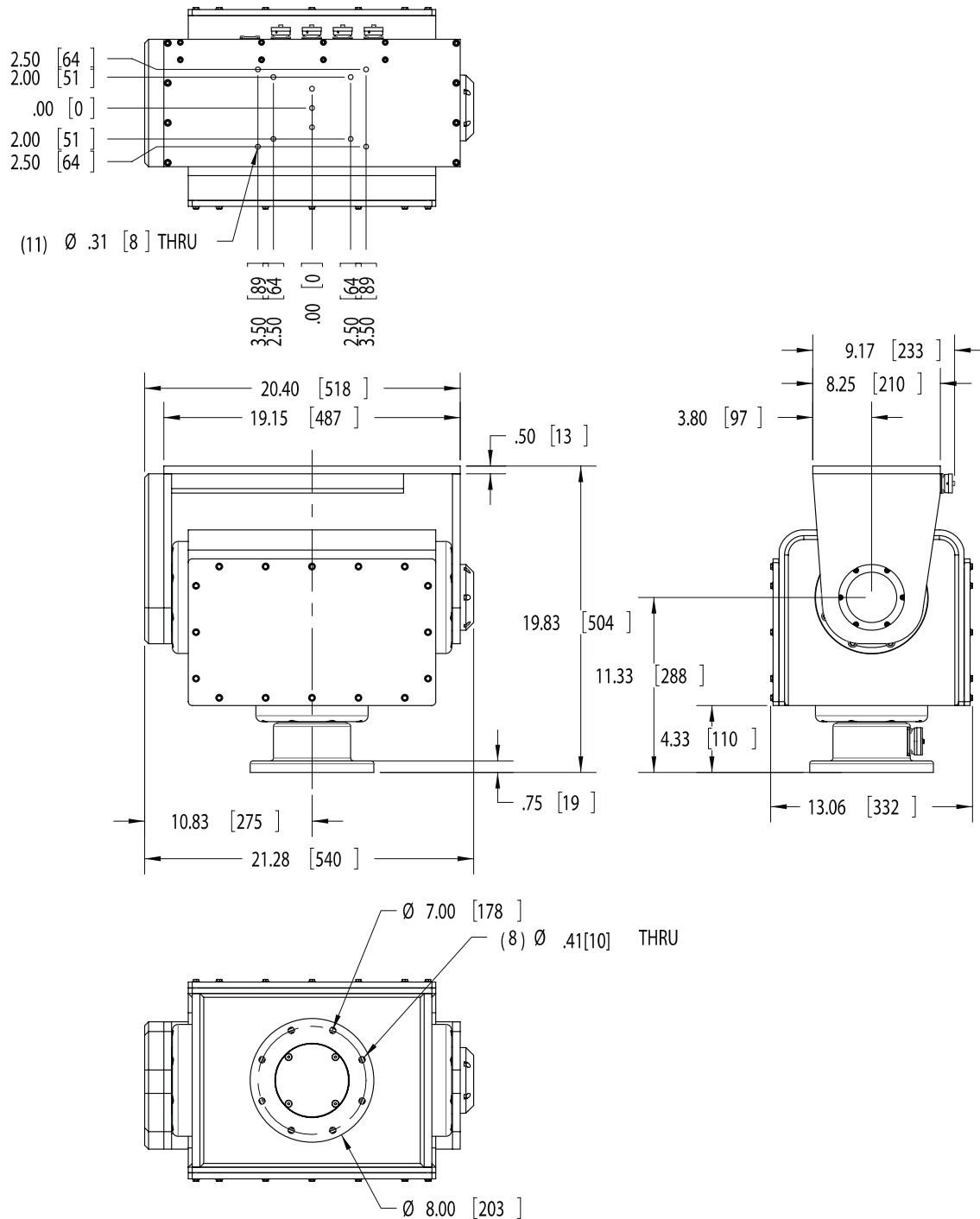
SECTION VI – Drawings & Schematics

NOTE: Refer to supplied drawings & schematics for your specific model.

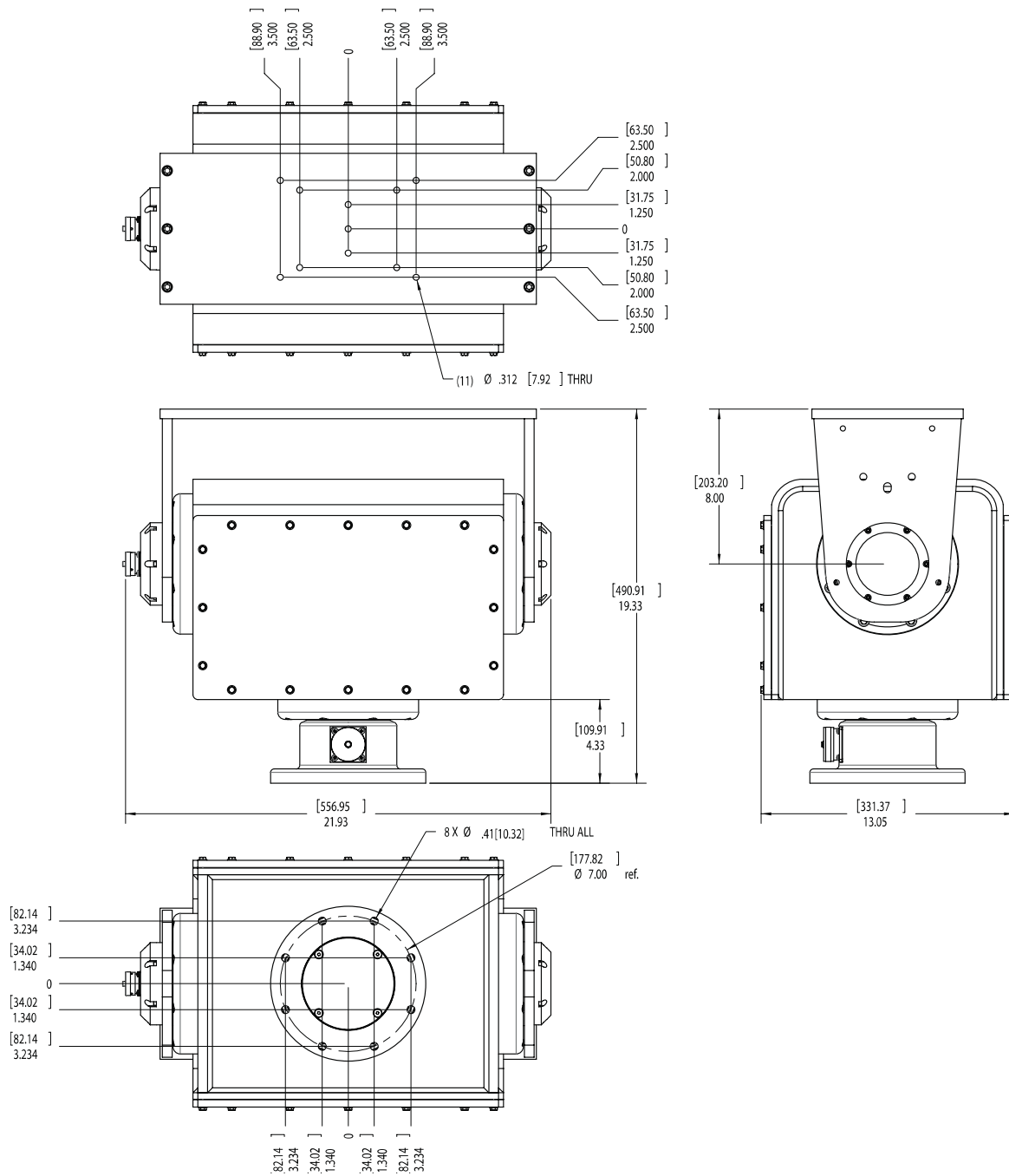
Table Top Dimensions



UNIVERSAL 4 CONNECTOR OVERALL DIMENSIONS



SINGLE TILT CONNECTOR OVERALL DIMENSIONS



PRODUCT SCHEMATIC

NOTE: Models vary, check your supplied schematic for the proper schematic.

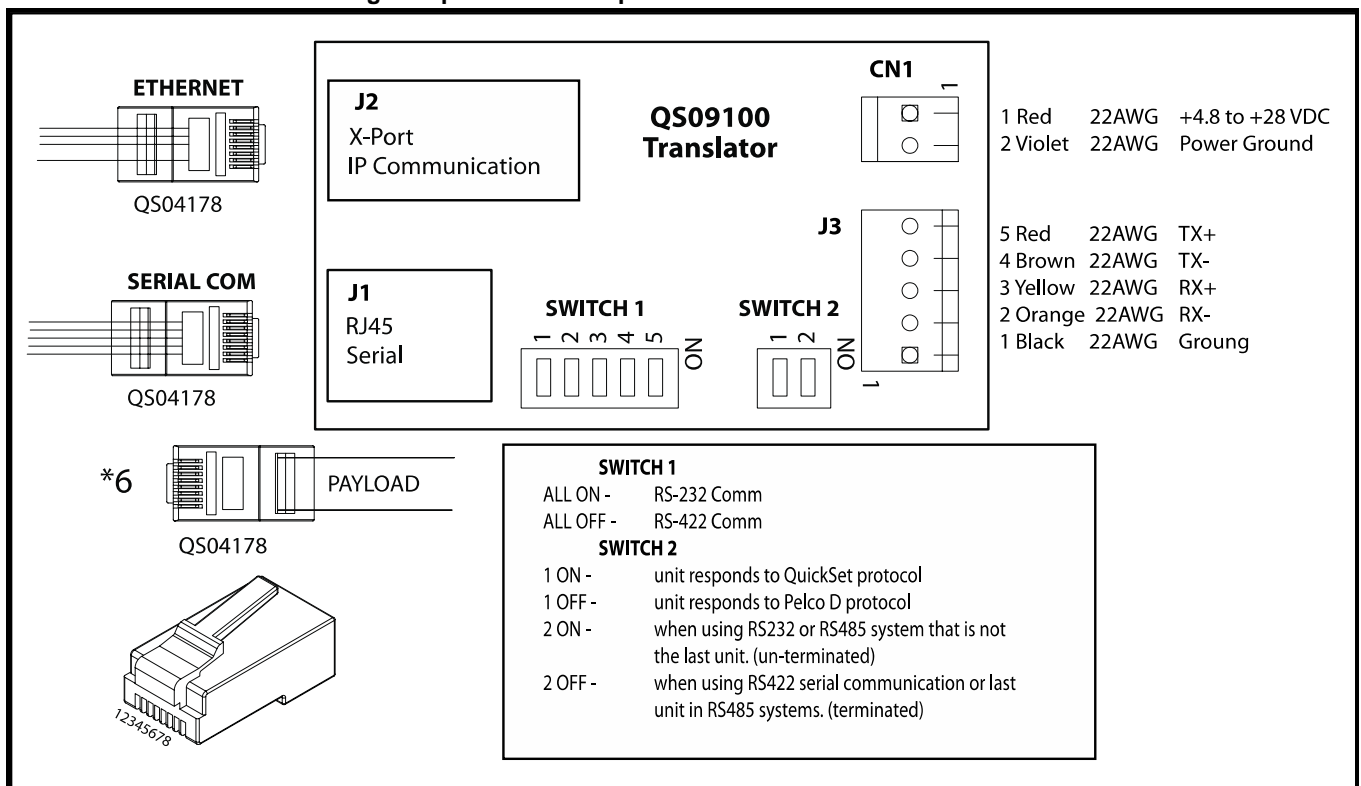
CABLE SCHEMATICS

NOTE: Models vary, check your supplied schematic for the proper schematic.

IP / SERIAL CONNECTION & SETTINGS

UNIVERSAL TRANSLATOR IP COMM & SERIAL PORT CONNECTIONS

Ethernet wiring is separate and independent. Default IP address is 192.168.1.1



Universal Translator IP COMM & Serial Port Connections (Internal)

NOTE: Refer to the UNIVERSAL TRANSLATOR USER'S GUIDE and the UNIVERSAL TRANSLATOR CONFIGURATION TOOL SOFTWARE MANUAL (supplied separately on CD00545) for complete Universal Translator operation.